

Tomorrow is going to be worse, but that doesn't mean today isn't bad

Storms in Iceland in 2015

ECMWF 9. June 2016

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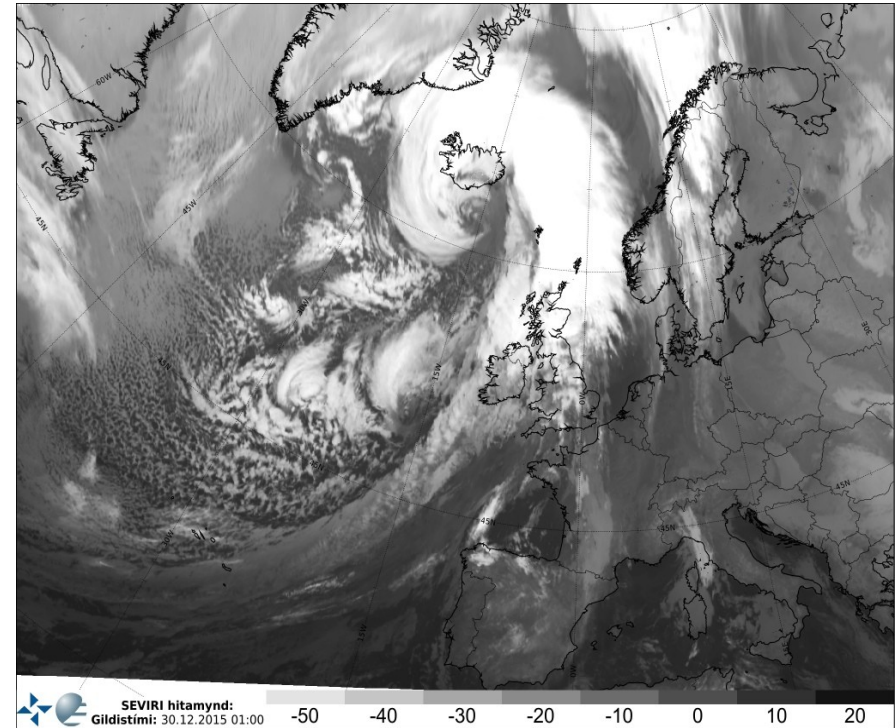
Halldór Björnsson

Theodór Freyr Hervarsson

Björn Sævar Einarsson

- A brief overview of Icelandic climate
- Overview of the week of 9 to 15 March 2015
- December 2015
- Comparison of models
- Impact

- Iceland is well (or poorly) situated in the North-Atlantic
- At 62-66 N, right in the path of intense cyclones
- Polar front



- The winter 2014-2015 was brutal
- November 2014 was 4,3 °C above average in Reykjavík.
- December 1st saw the first storm
- ... of around 50 events (20 m/s or more)
- The „series“ ended with record braking winds

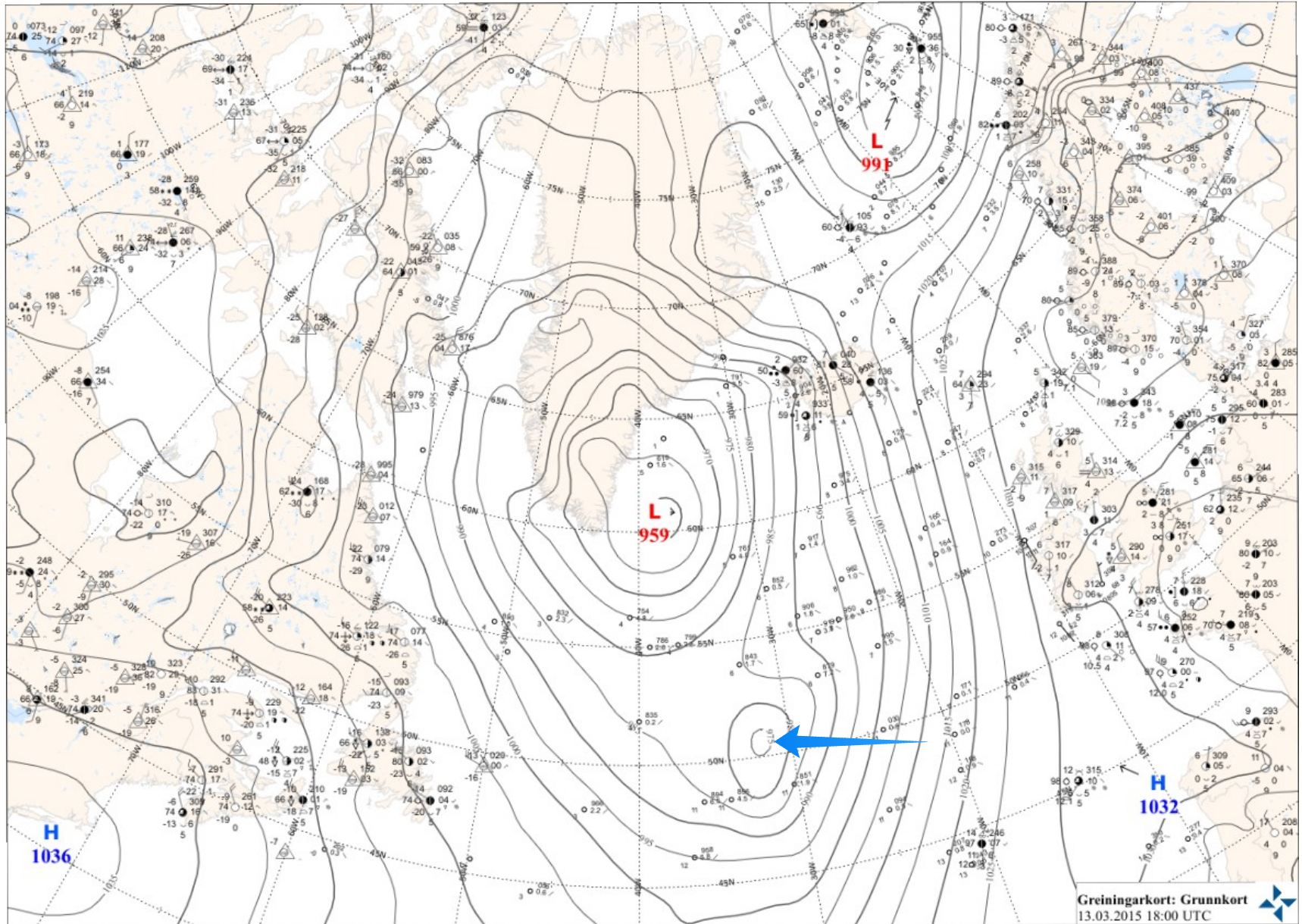


Winter 2015-2016

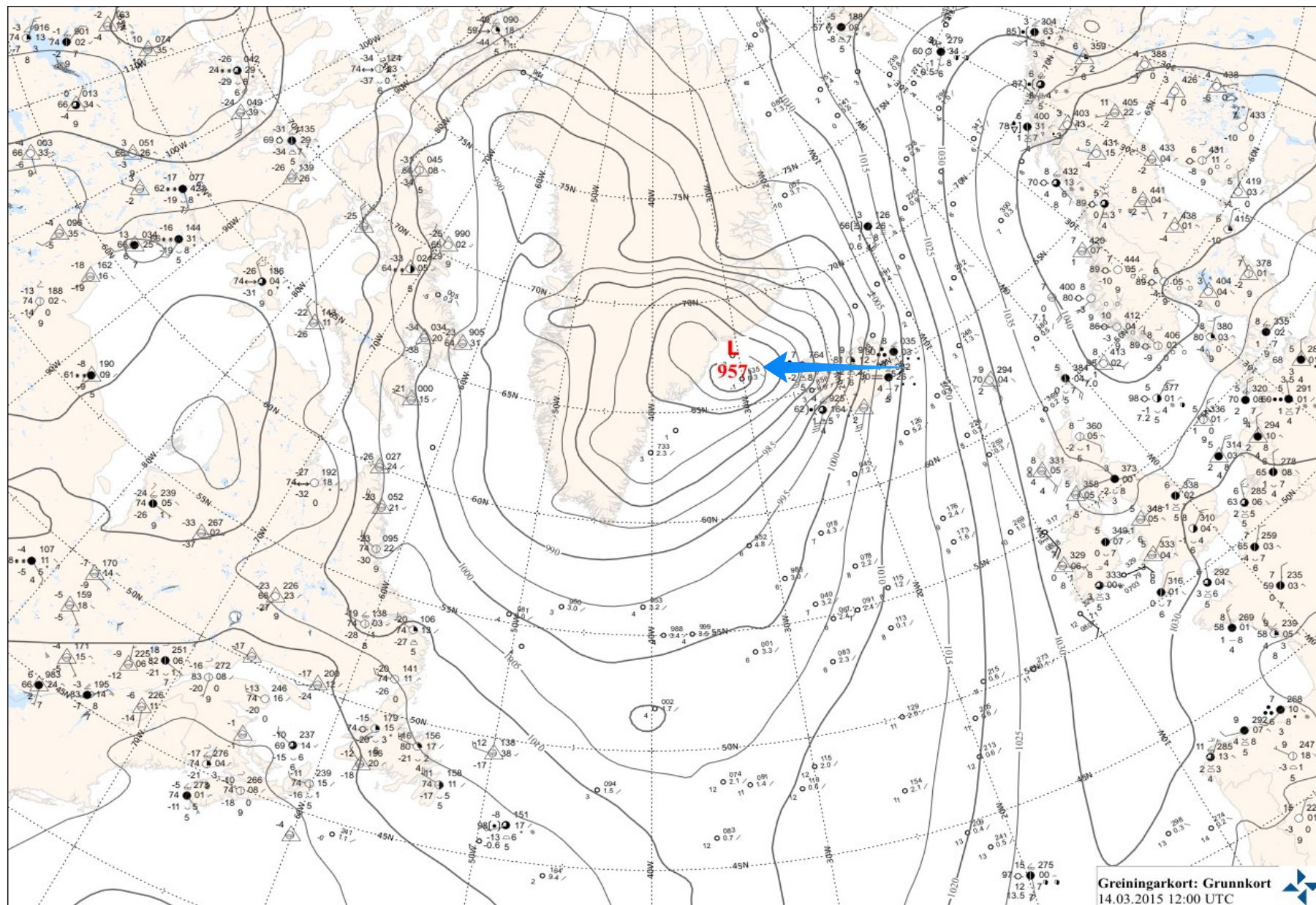
- Not as brutal as the previous winter
- Winter defined by bombing cyclones and high social impact
- Three severe storms in December causing damage, impact and a new way of thinking
- Damages estimated on the order of 1-2 million GBP

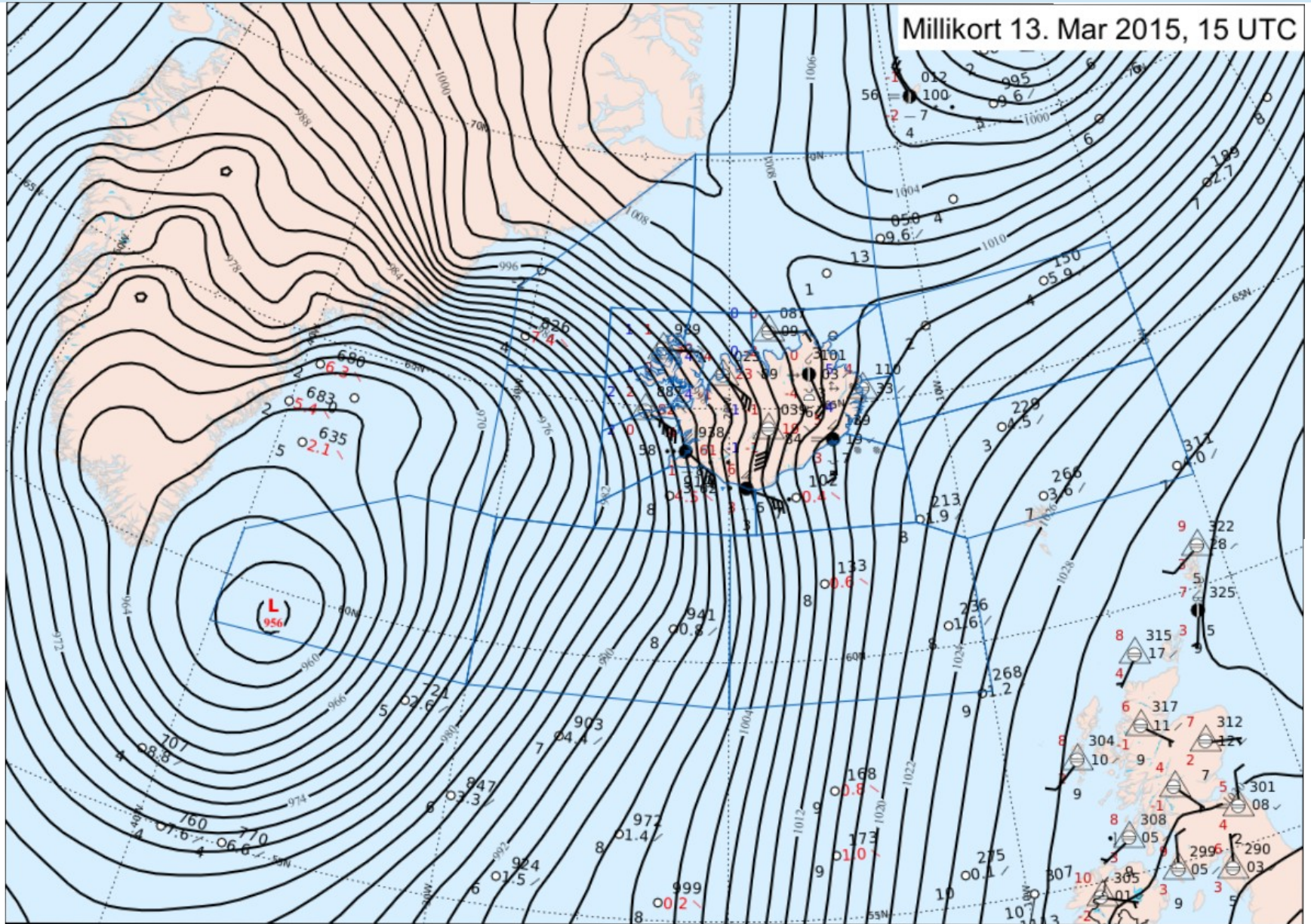


March 13-14 2015

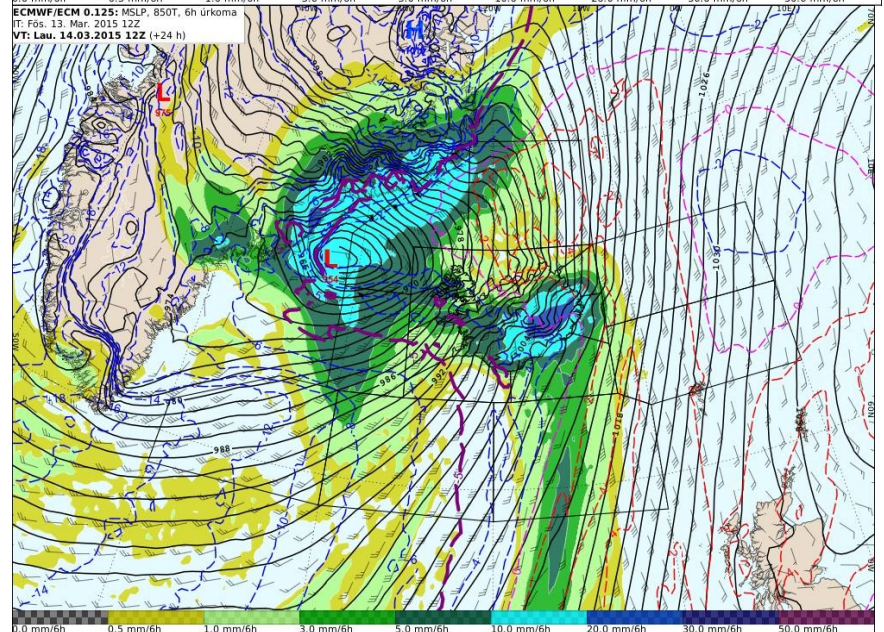
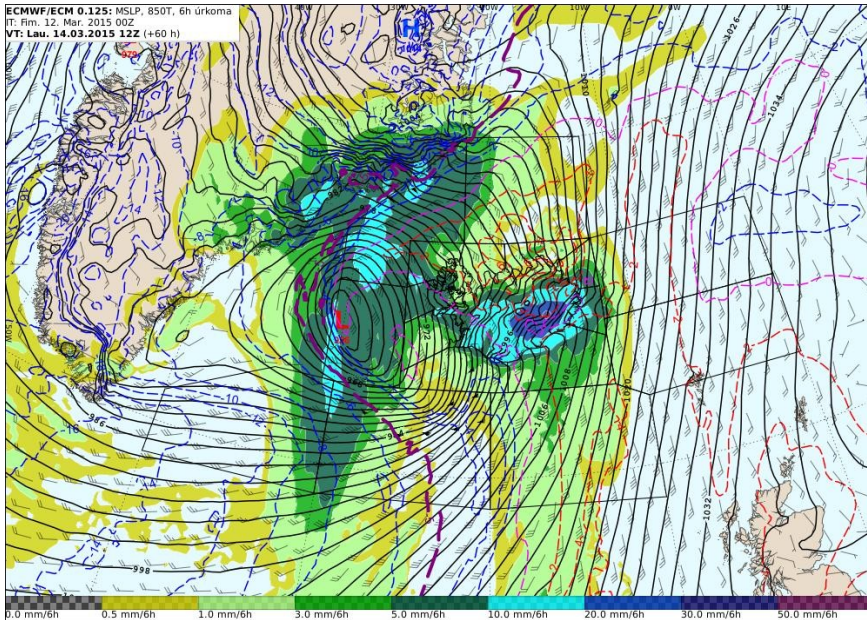
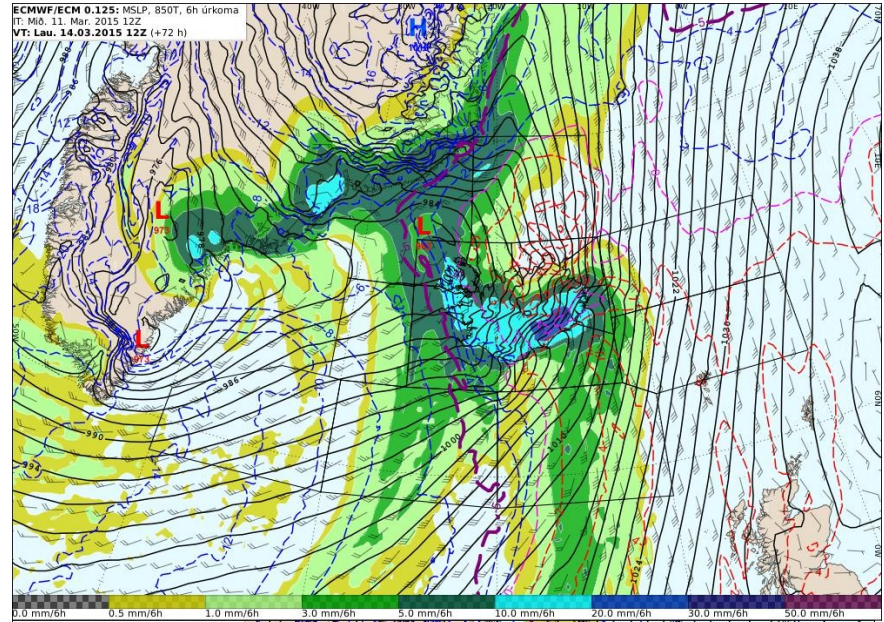
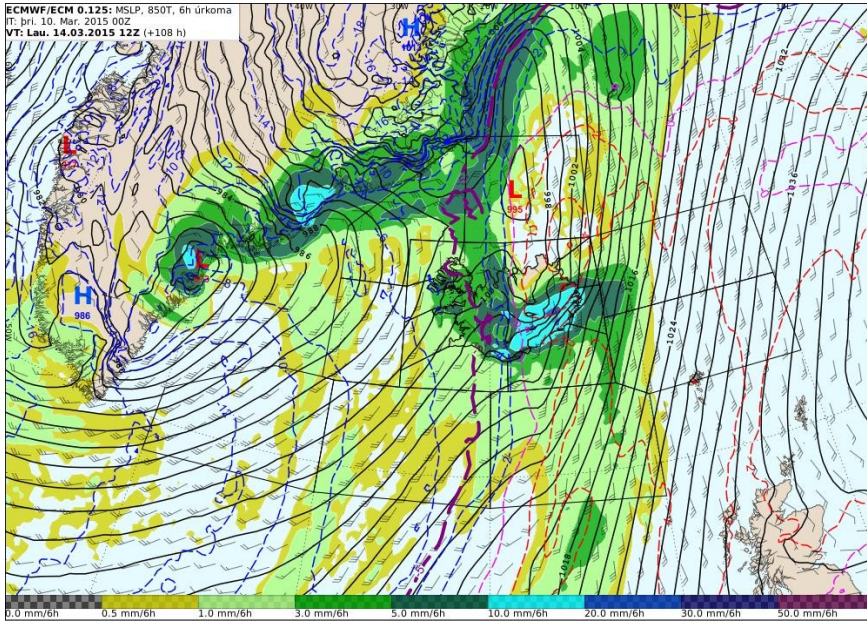


March 13-14 2015

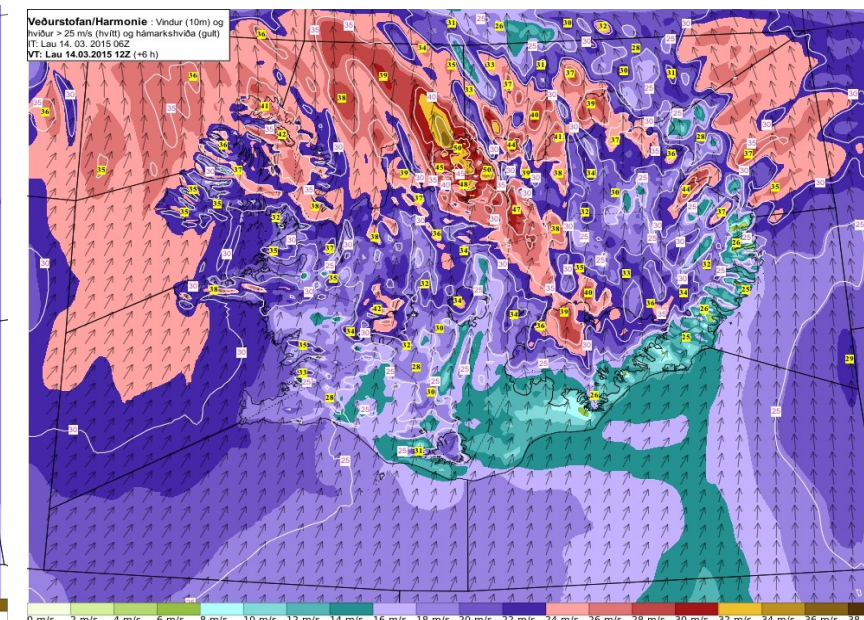
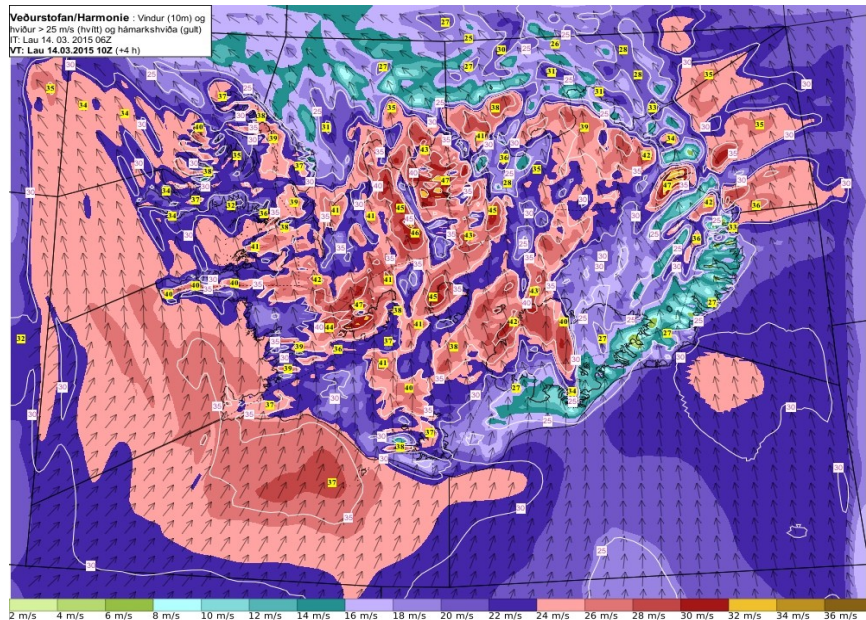
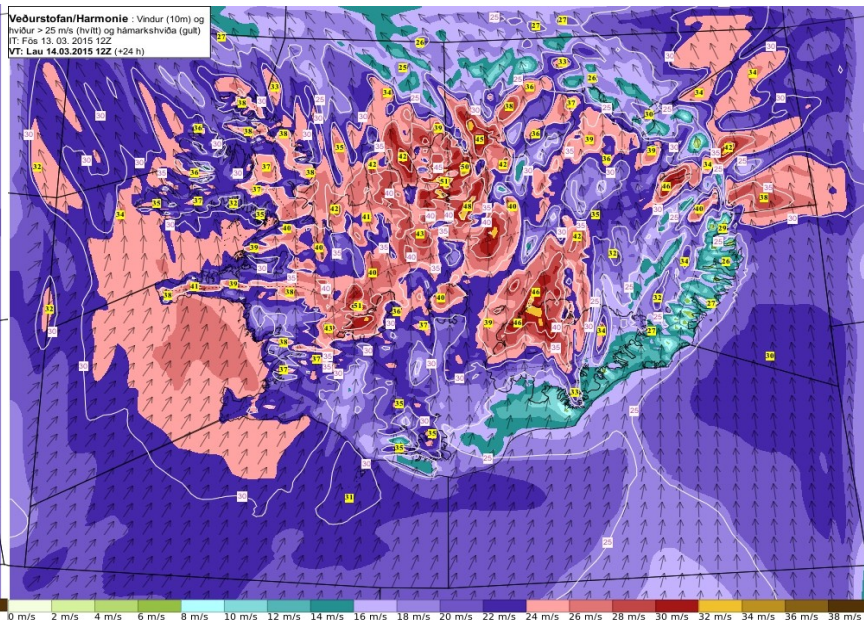
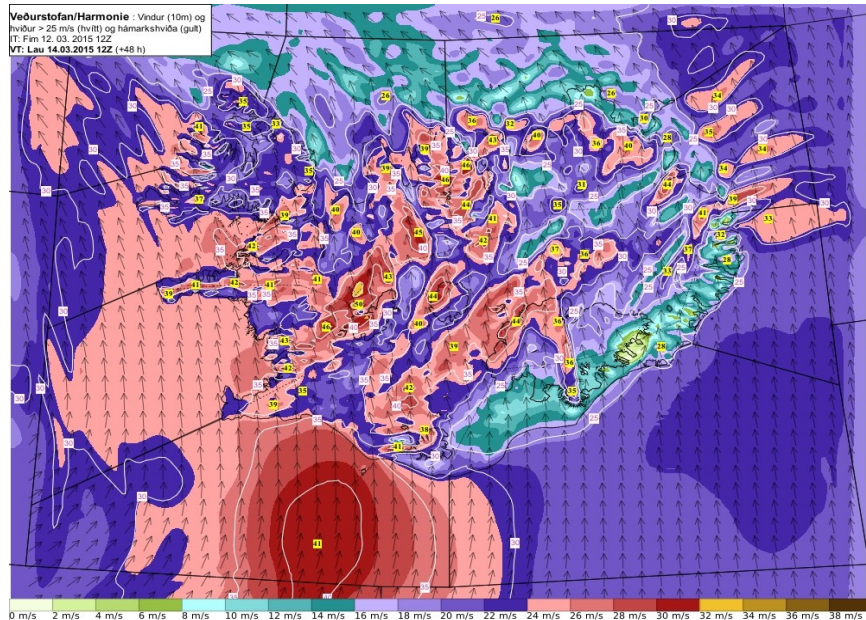




ECMWF VT: 12Z FC: +108h +72h +60h +24h

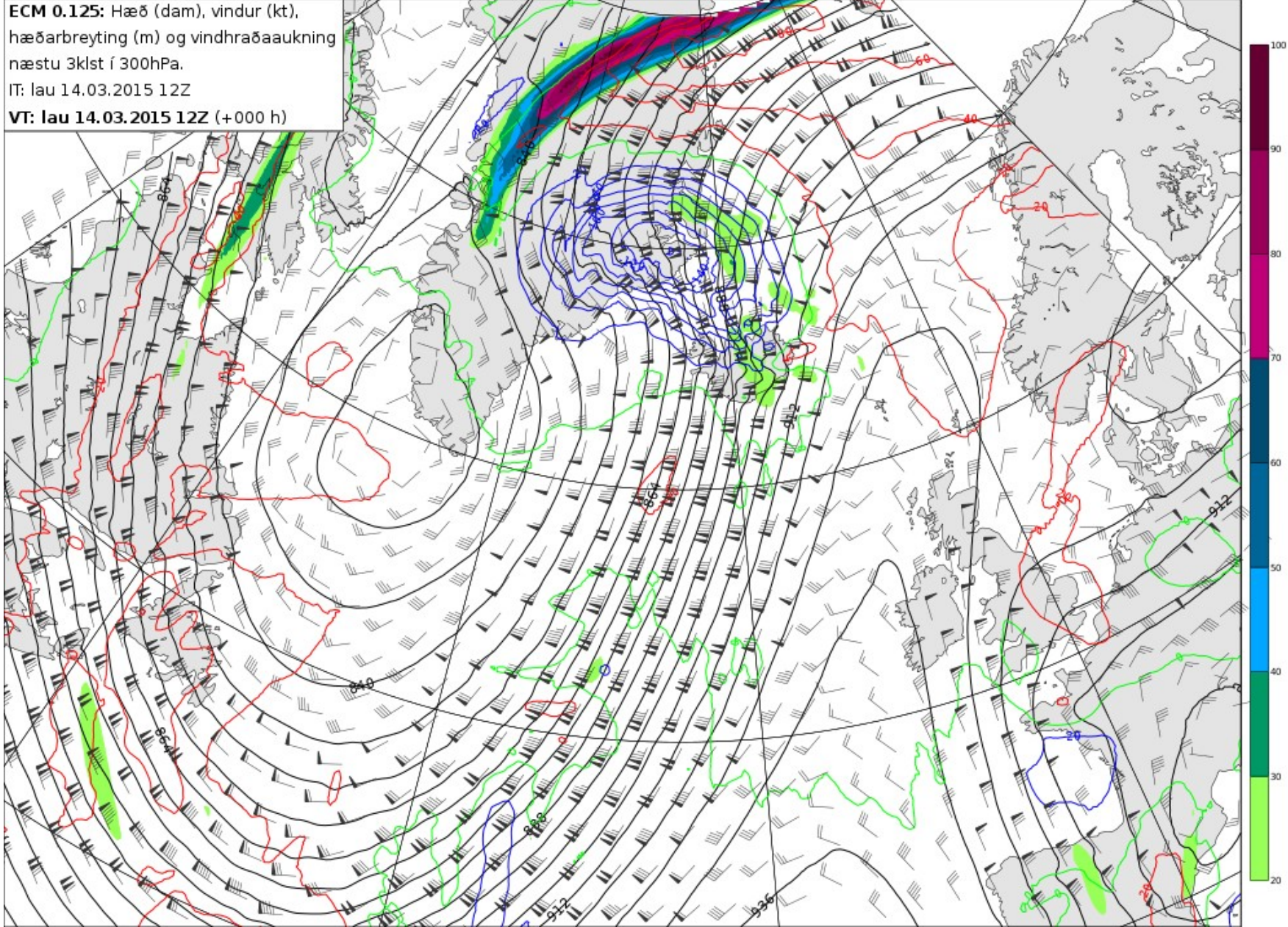


Harmonie 2,5 km +48h, +24h, +6h, +4h



Why so fast?

ECM 0.125: Hæð (dam), vindur (kt),
hæðarbreyting (m) og vindhraðaaukning
næstu 3klst í 300hPa.
IT: lau 14.03.2015 12Z
VT: lau 14.03.2015 12Z (+000 h)



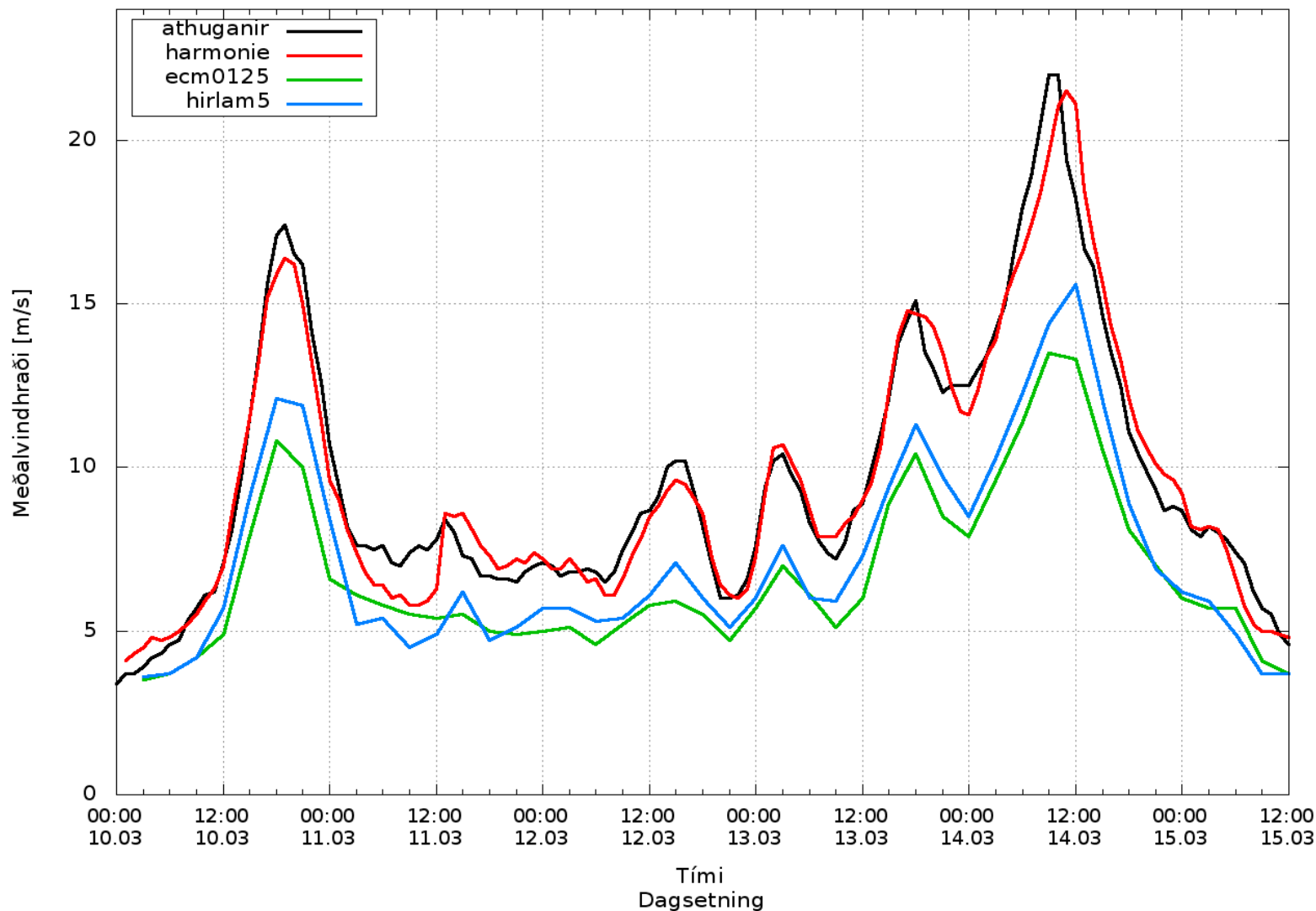
ECMWF Mean sea level pressure forecasts

VT: 2015-03-14 kl. 12:00

IT	VT	West coast	East coast	Difference
2015-03-10 00Z	+108	997,7	1007,7	10,0
2015-03-10 12Z	+96	986,4	1007,5	21,1
2015-03-11 00Z	+84	986,5	1006,6	20,1
2015-03-11 12Z	+72	985,5	1007,1	21,6
2015-03-12 00Z	+60	974,0	1009,2	35,2
2015-03-12 12Z	+48	973,8	1009,9	36,1
2015-03-13 00Z	+36	973,9	1008,6	34,7
2015-03-13 12Z	+24	982,6	1007,6	25,0
Observations		West coast	East coast	Difference
2015-03-14 kl. 10:00		970,4	1008,0	37,6

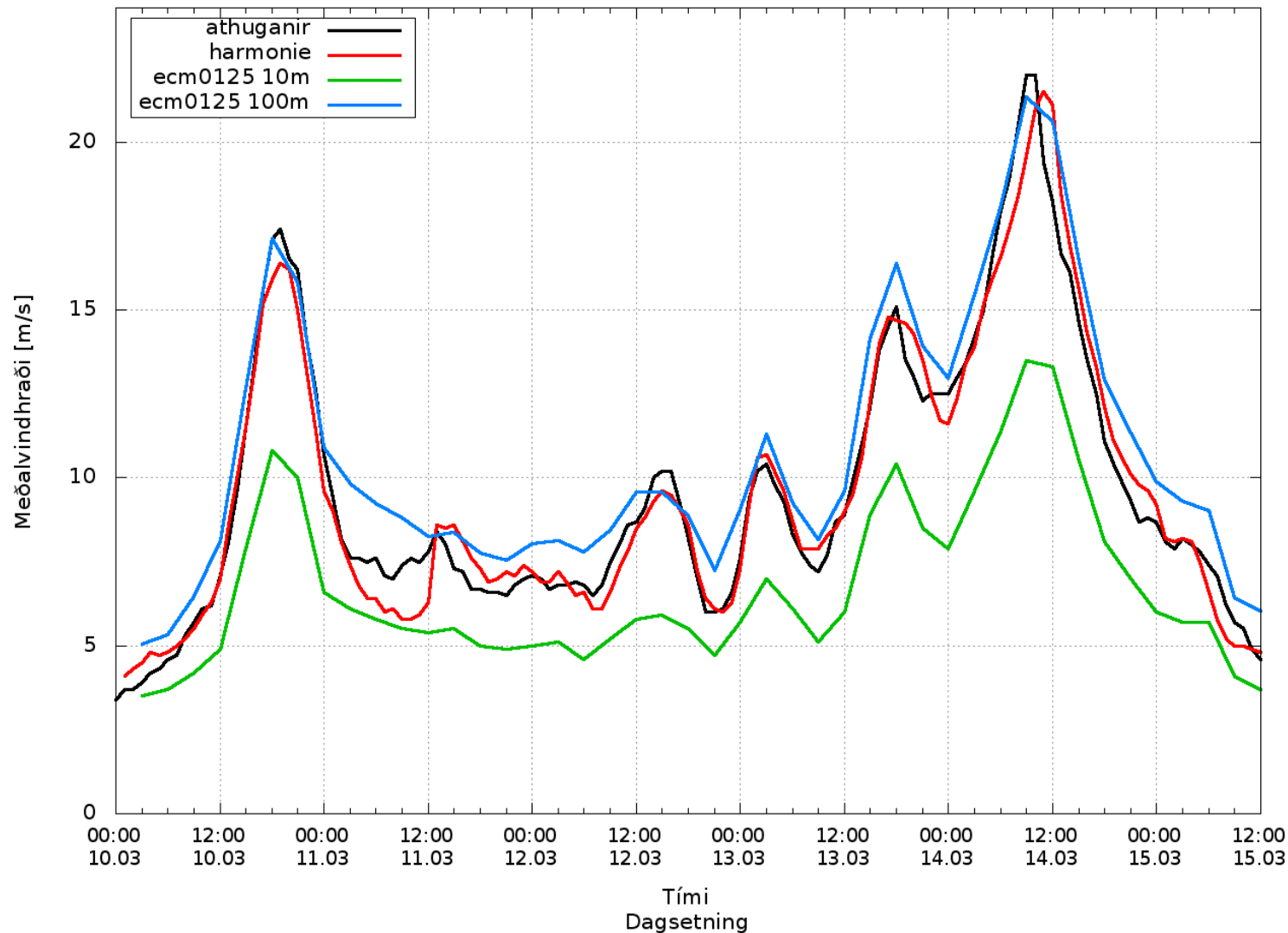
Meðalvindhraði – athuganir og spár

Meðalvindhraði 10. - 15. mars 2015
Athuganir og staðaspár (13 til 24 klst. spár)
Meira en 140 sjálfv. stöðvar

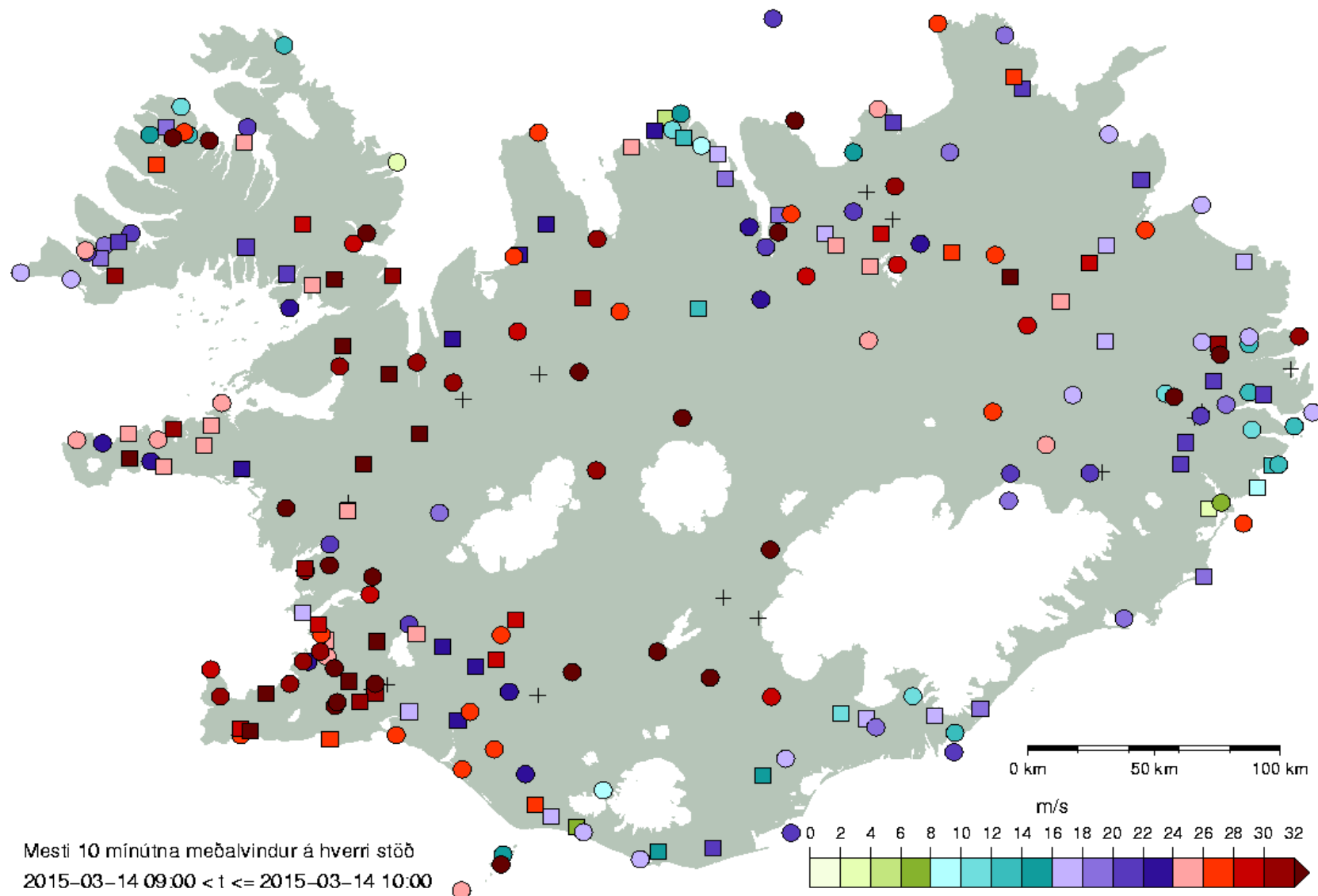


Meðalvindhraði – ECMWF 100m vindur

Meðalvindhraði 10. - 15. mars 2015
Athuganir og staðaspár (13 til 24 klst. spár)
Meira en 140 sjálfv. stöðvar

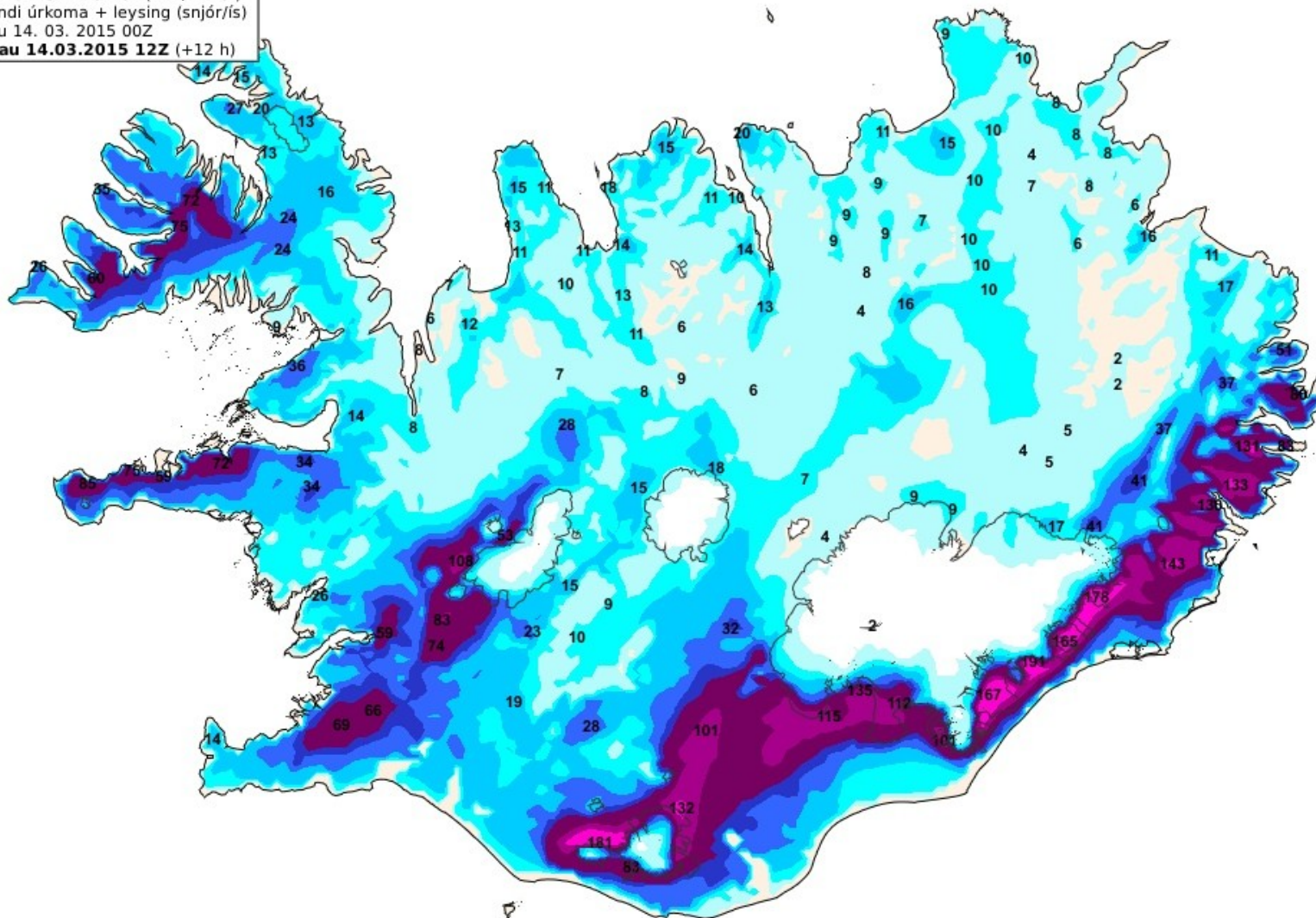


Max 10m wind between 9 and 10 UTC, 14. March



Harmonie – Total runoff (mm/12klst)

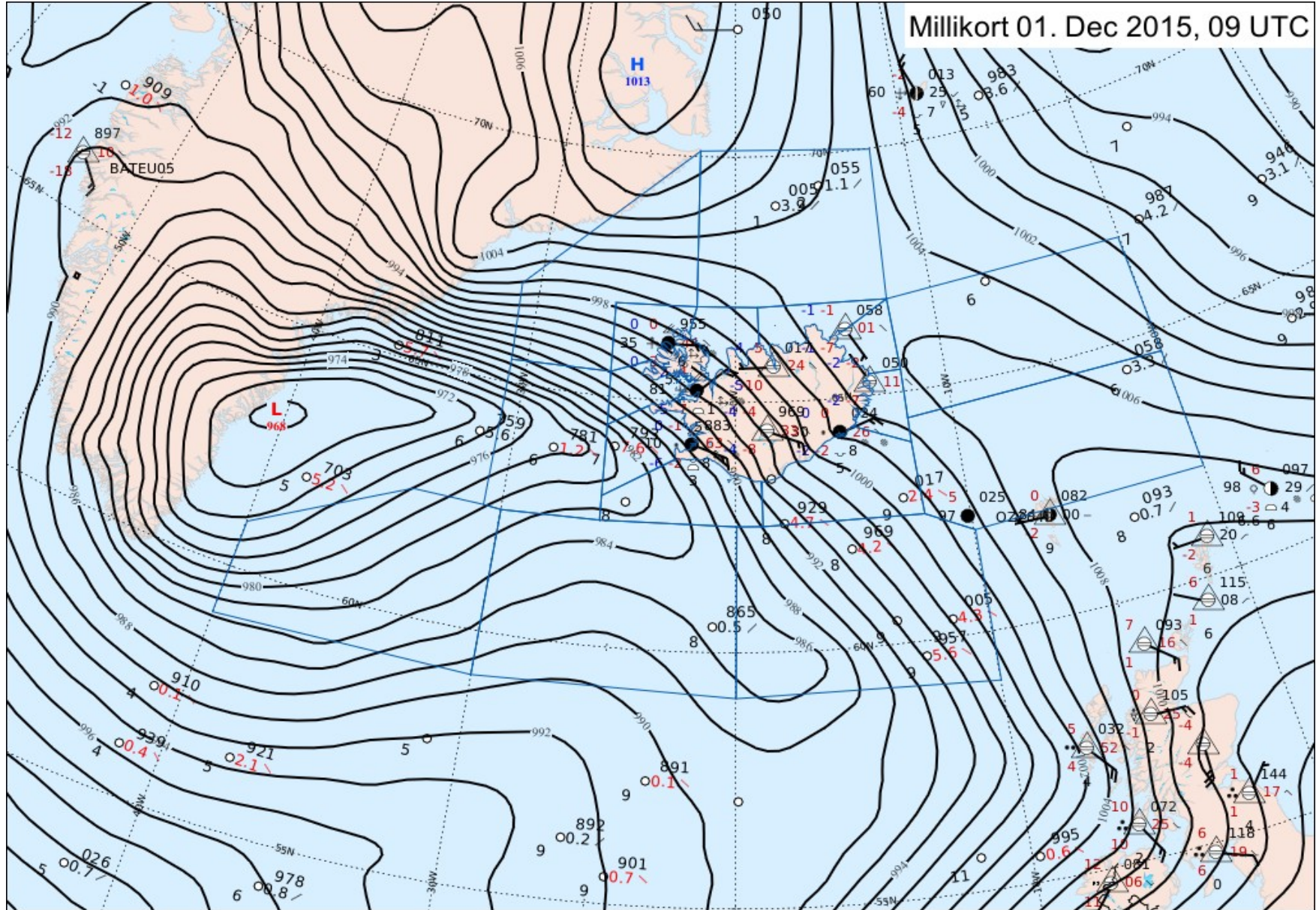
Harmonie: Afrennsli (mm/12klst)
Fljótandi úrkoma + leysing (snjór/ís)
T: Lau 14. 03. 2015 00Z
VT: Lau 14.03.2015 12Z (+12 h)



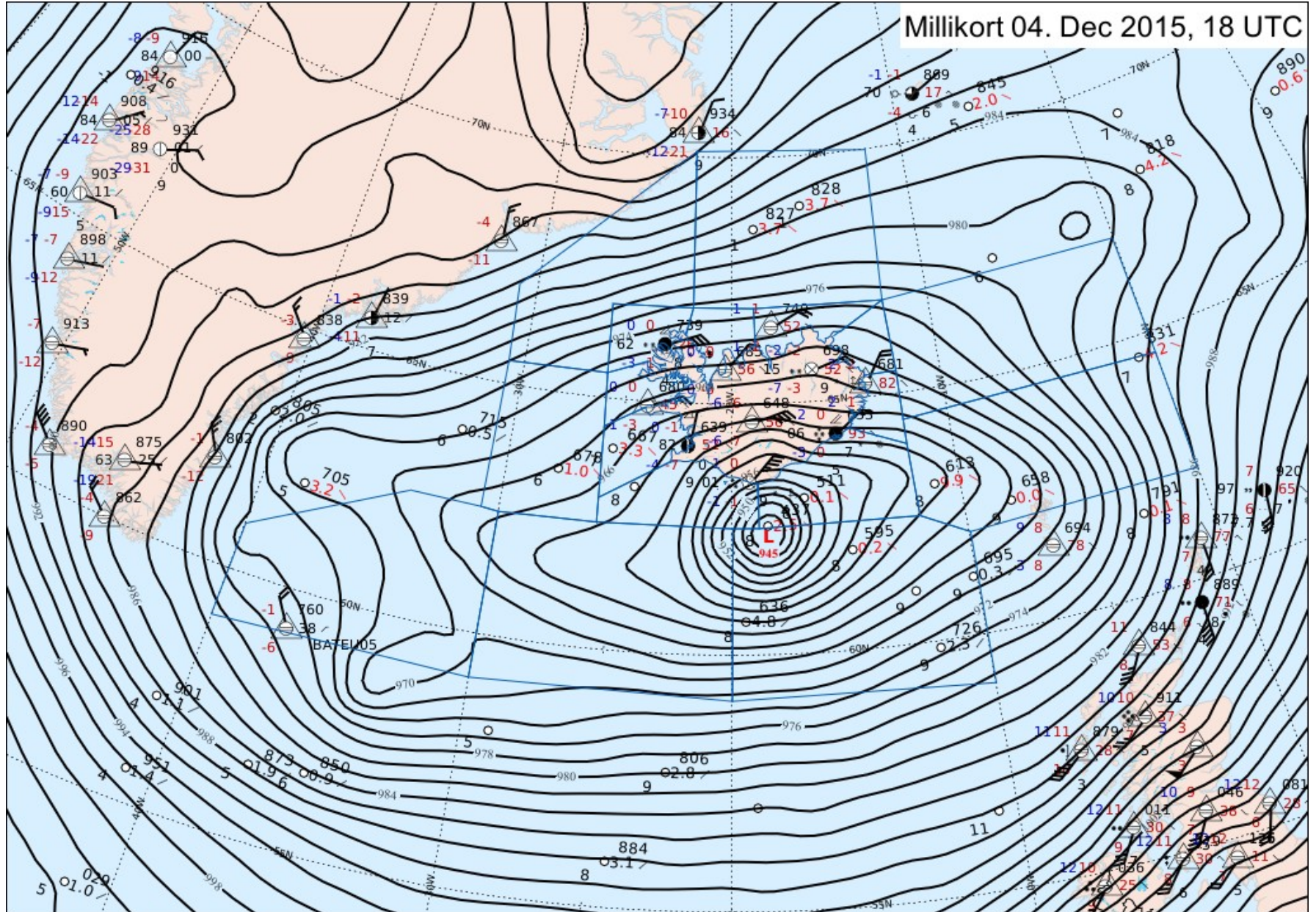
Impact - Reykjavík

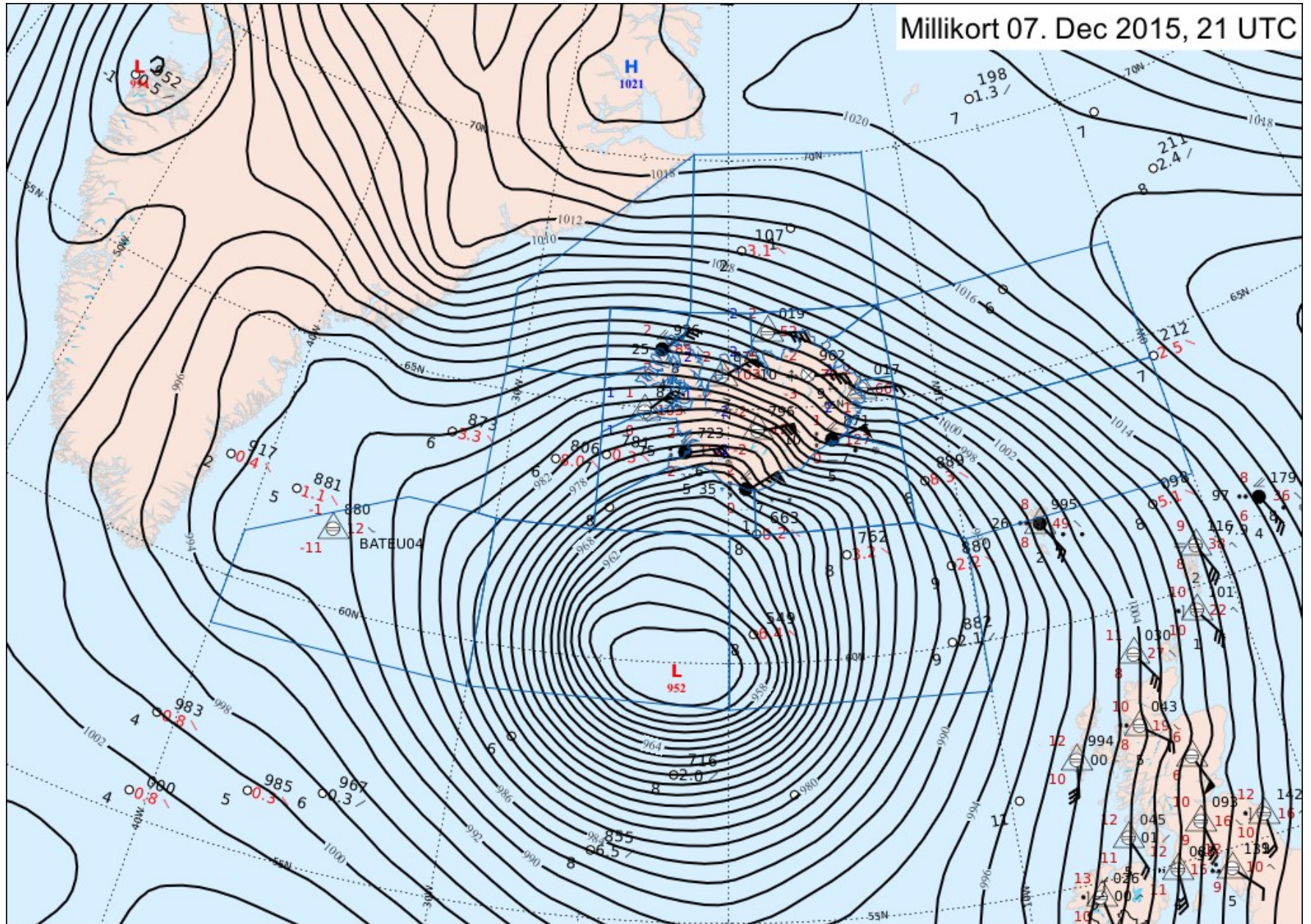


- „ we probably won't have to deal with anything like this for a while...“

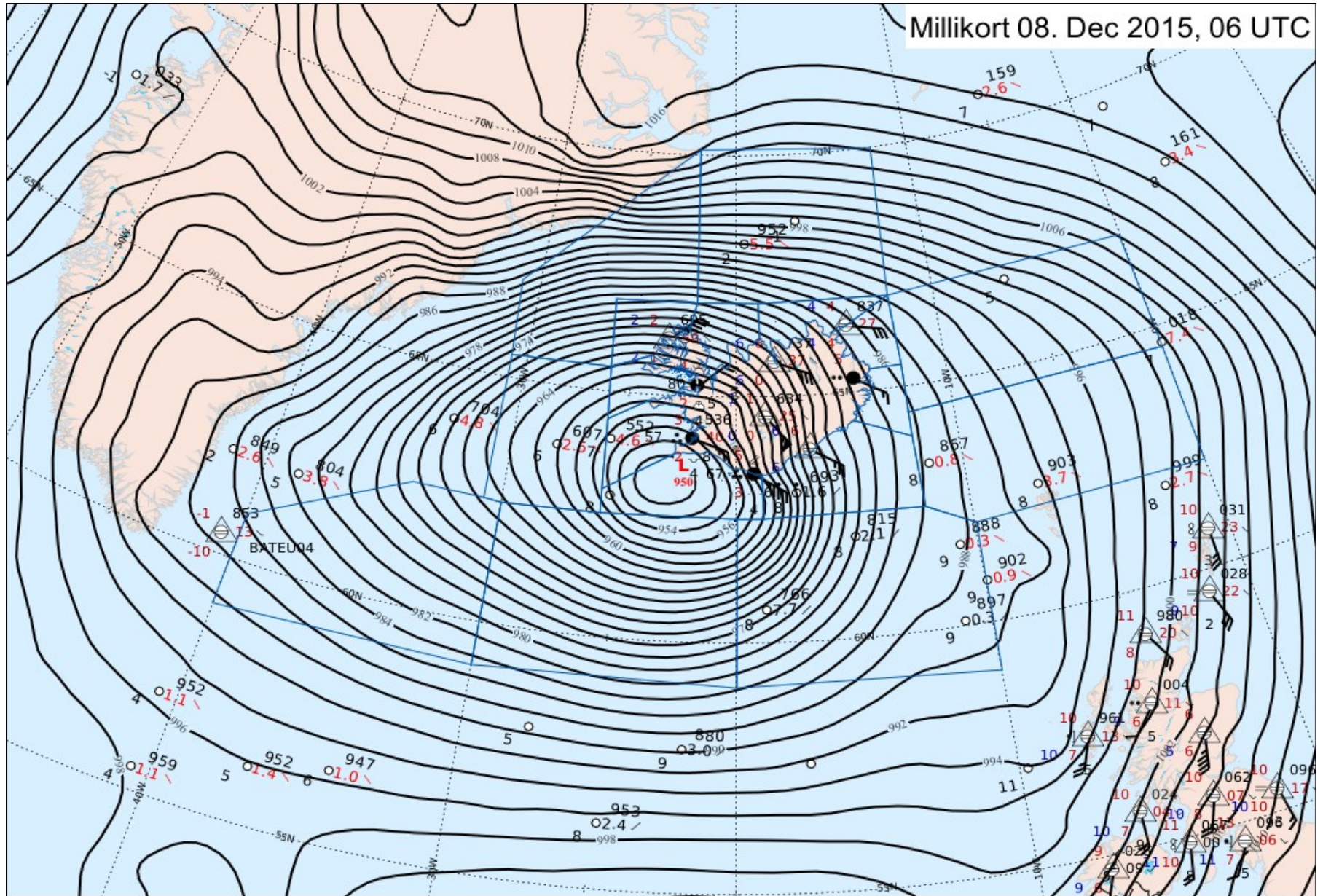


4. December 2015

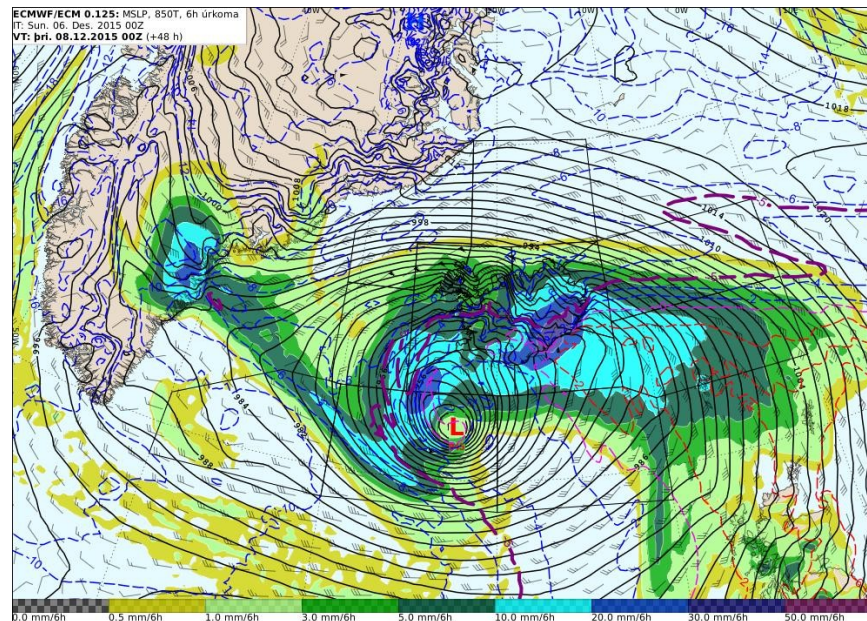
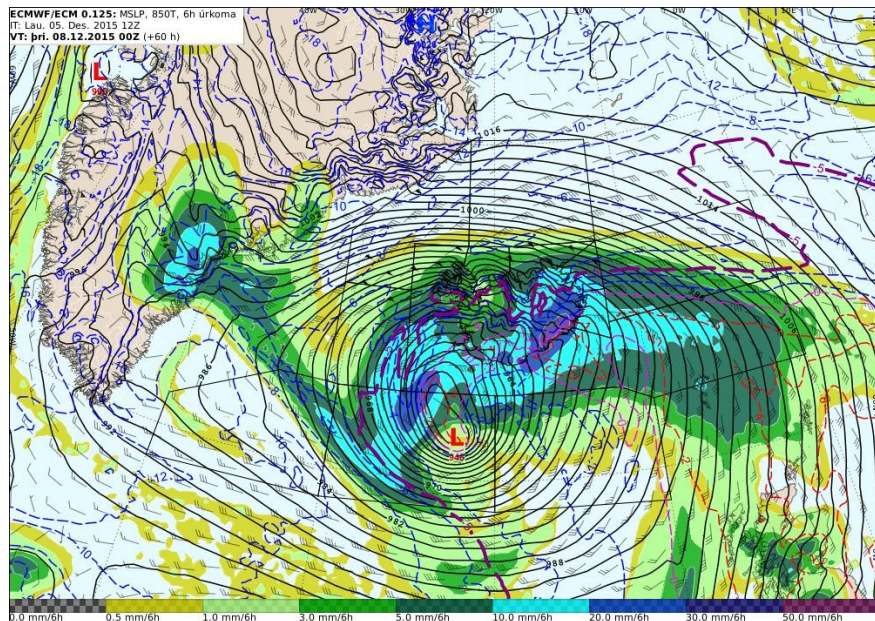
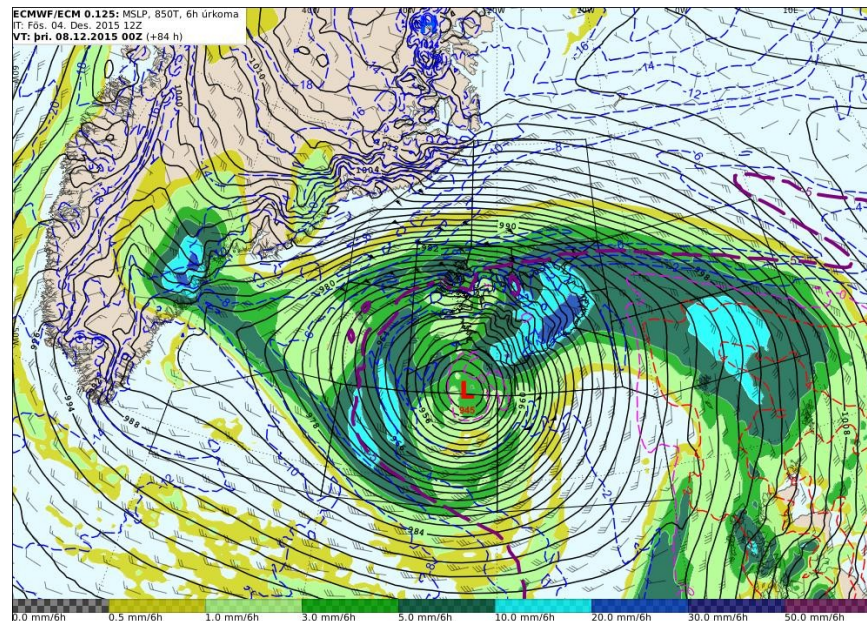
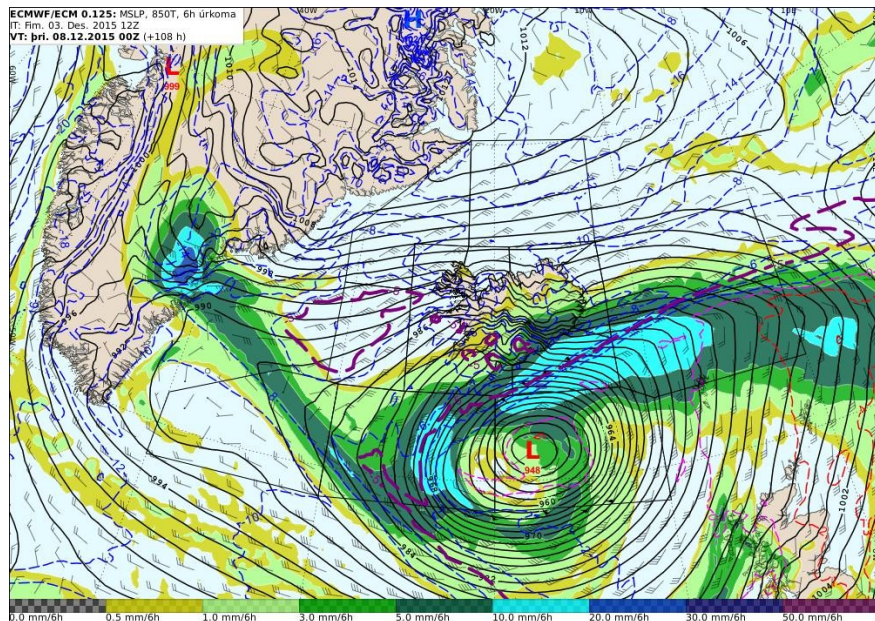




8. December 2015

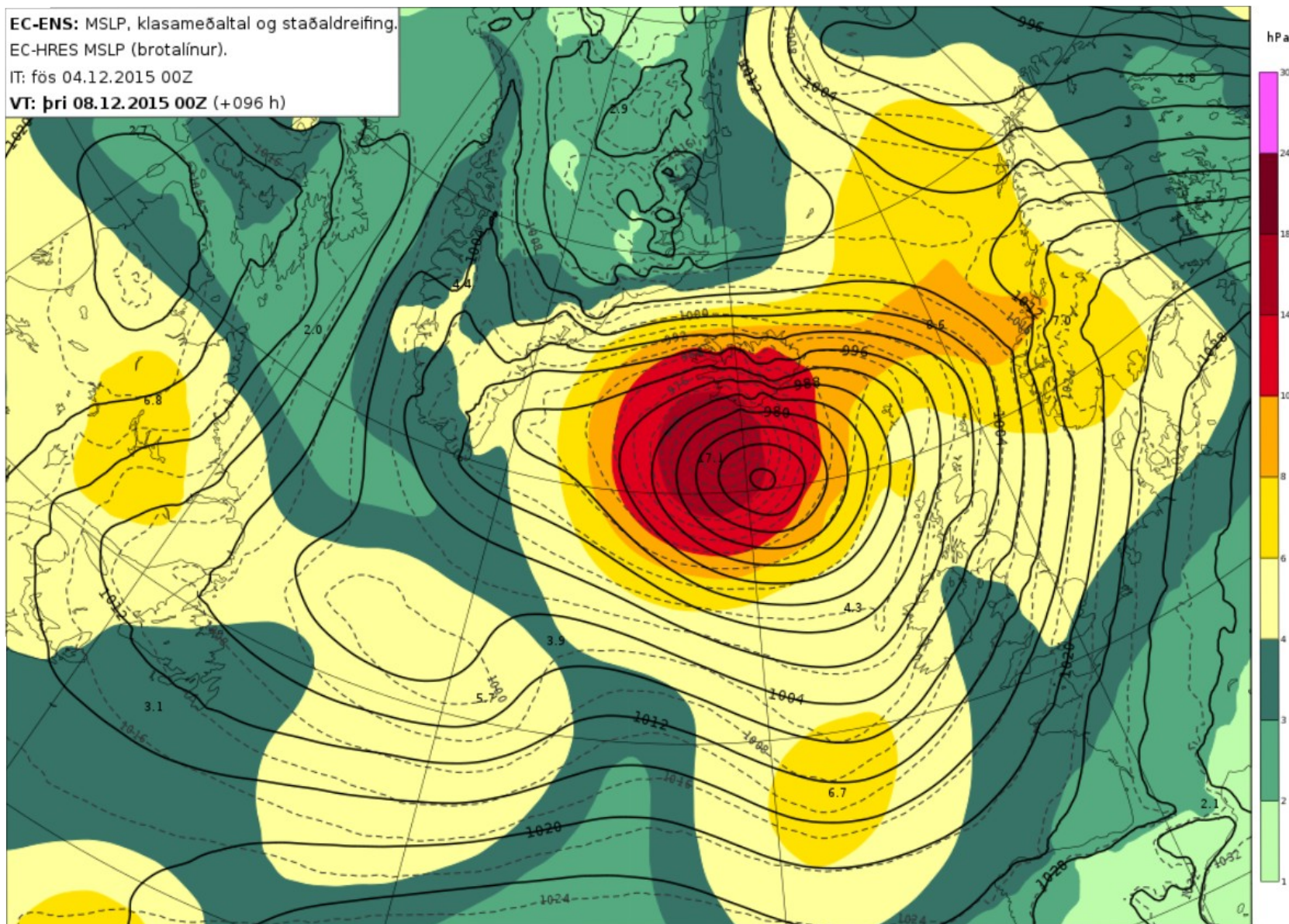


EC-HRES, +108h, +84h, +60h, +48h

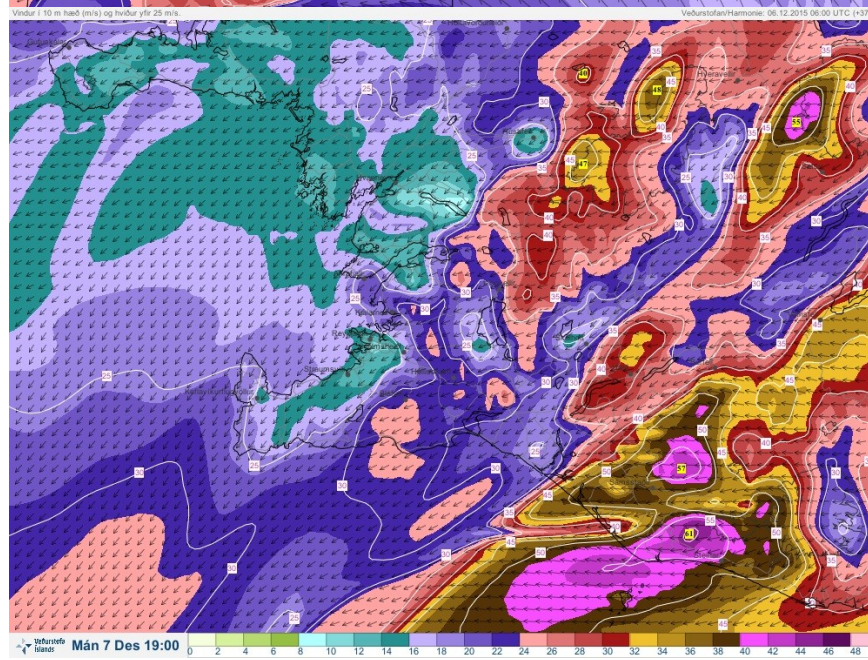
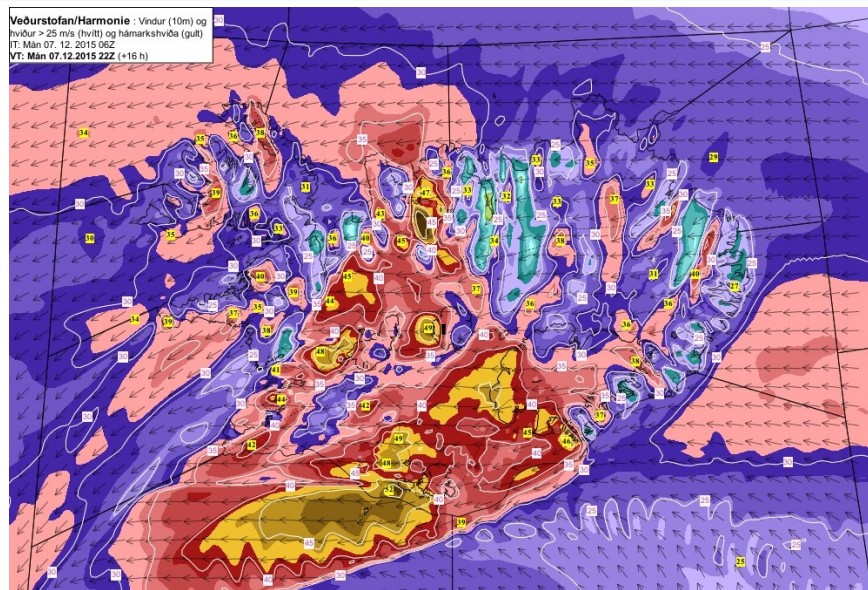
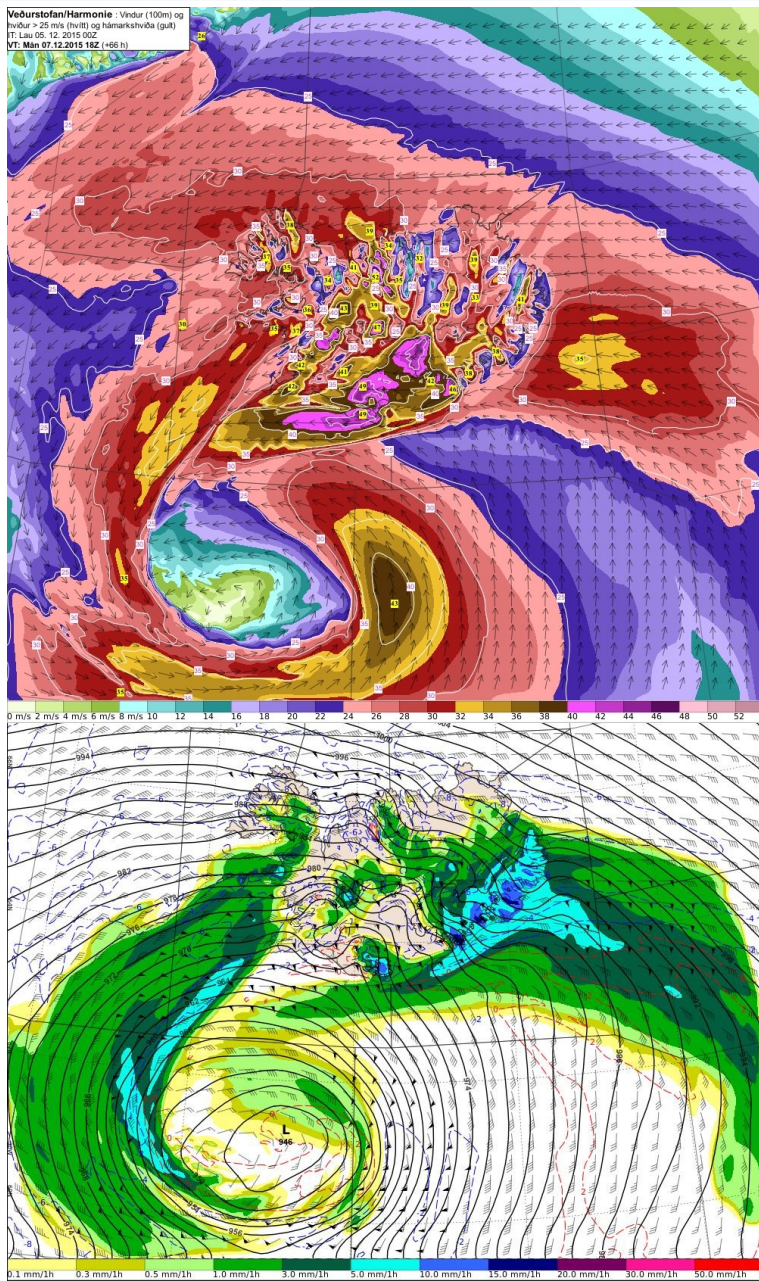


EC-ENS, MSP, STDEV, HRES

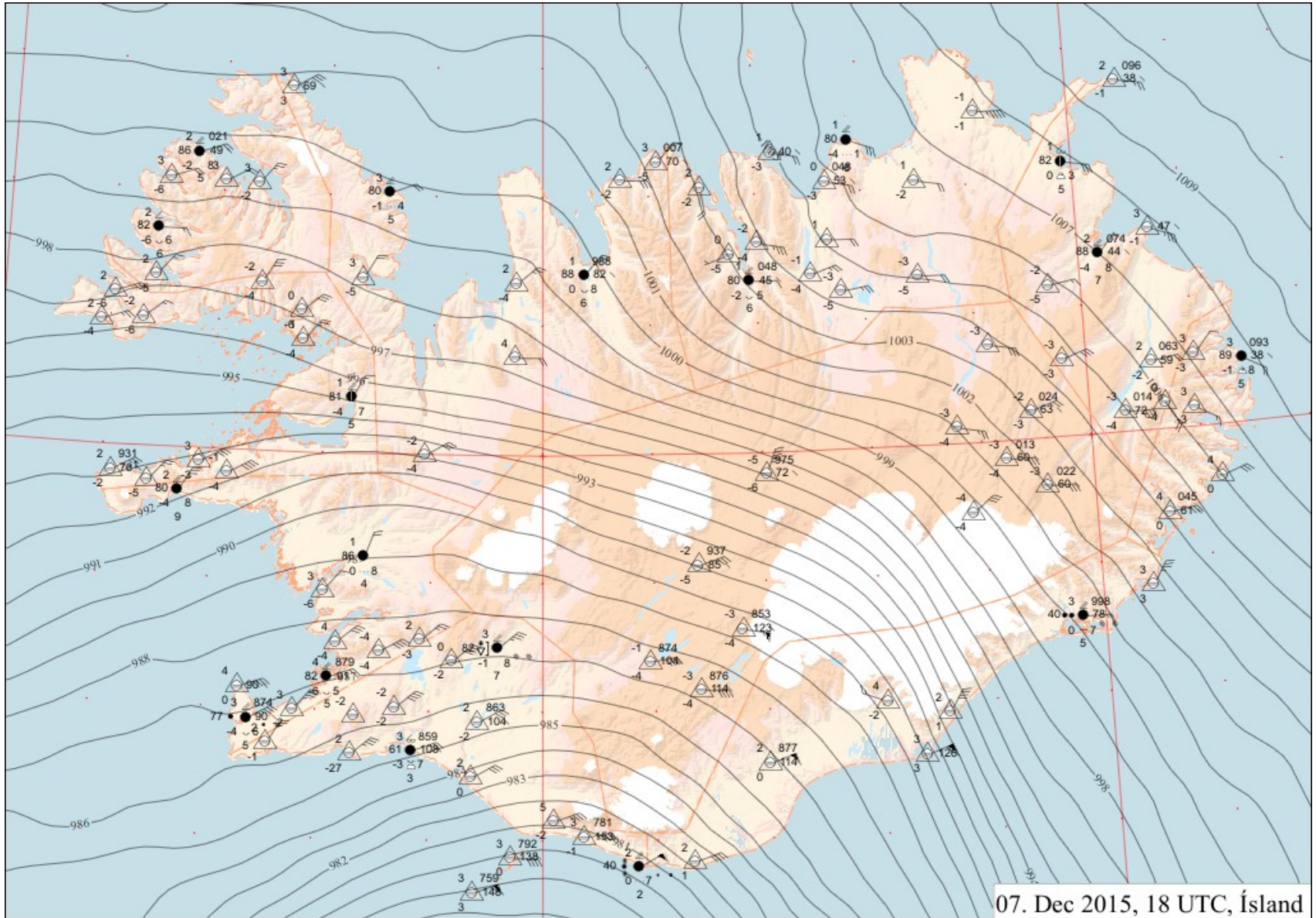
EC-ENS: MSLP, klasameðaltal og staðaldreifing.
EC-HRES MSLP (brotalínur).
ÍT: fös 04.12.2015 00Z
VT: þri 08.12.2015 00Z (+096 h)



HARMONIE, +66h, +16h,

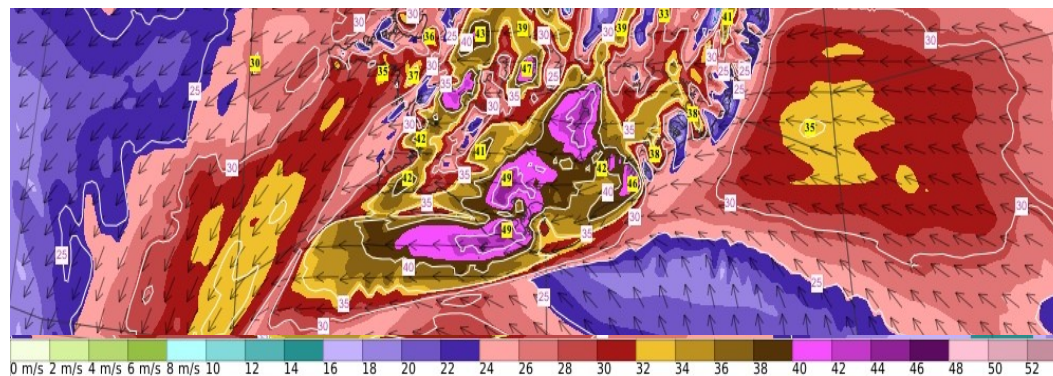


Iceland synoptic map



How do you forecast such a storm?

- The weather the days before was unstable
- 1st December had a warning for the capital area due to snow
- 4th December many drivers got into trouble in SE-Iceland
- ... we had never seen this colours in a surface wind forecast!



- 6th December 2015 the forecasters were certain enough about the forecast to call in „special forces“
- Civil Protection Agency
- Icelandic Aviation Authorities
- Icelandic Road and Coastal Administration
- Stakeholders from biggest airlines, including Icelandair and WOW
- Search and Rescue

- Civil Protection decided to advice people to stay at home, and leave work early
- Road Authorities physically closed roads with bars, with up to 3 hours lead time
- Icelandic Aviation Authorities – flights were moved to clear the runways before the weather hit

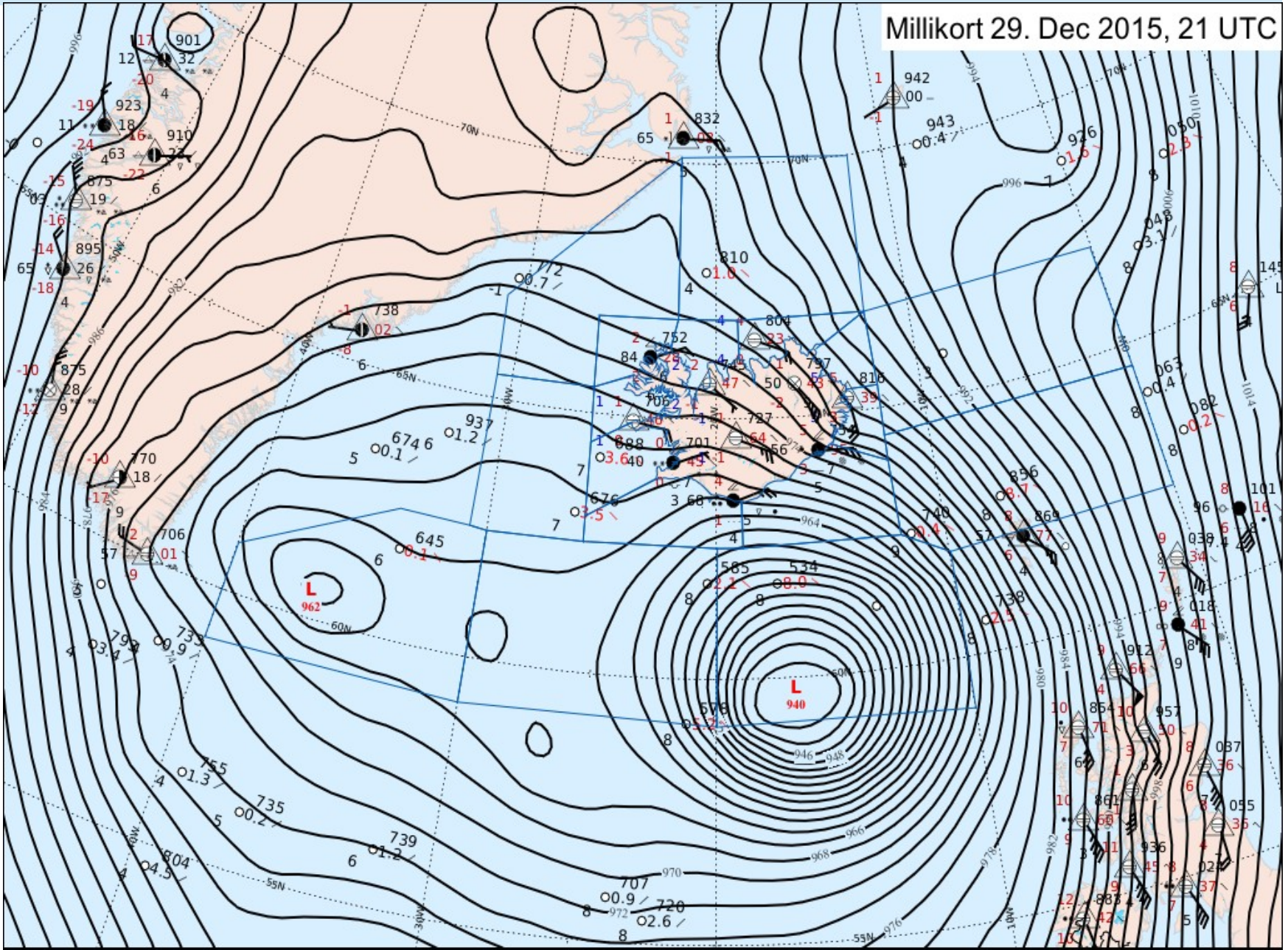
Impact



Impact



Millikort 29. Dec 2015, 21 UTC



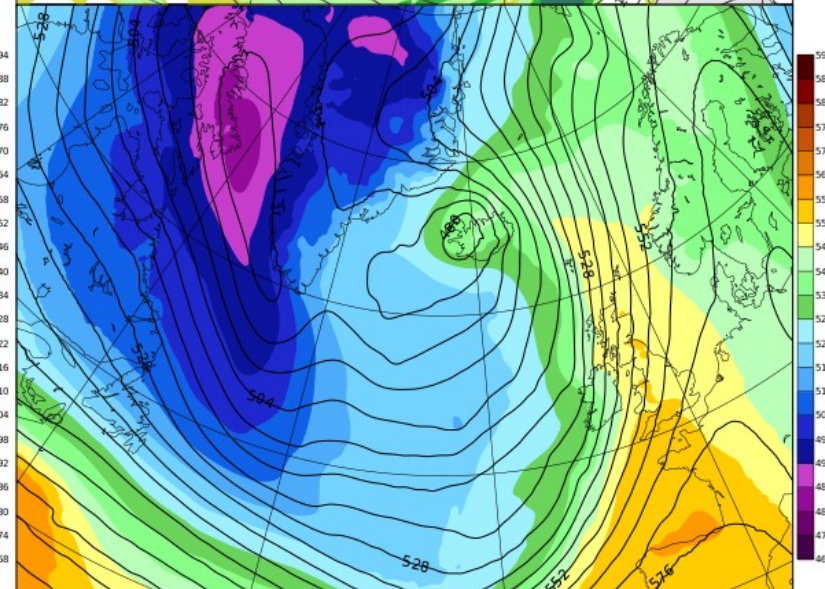
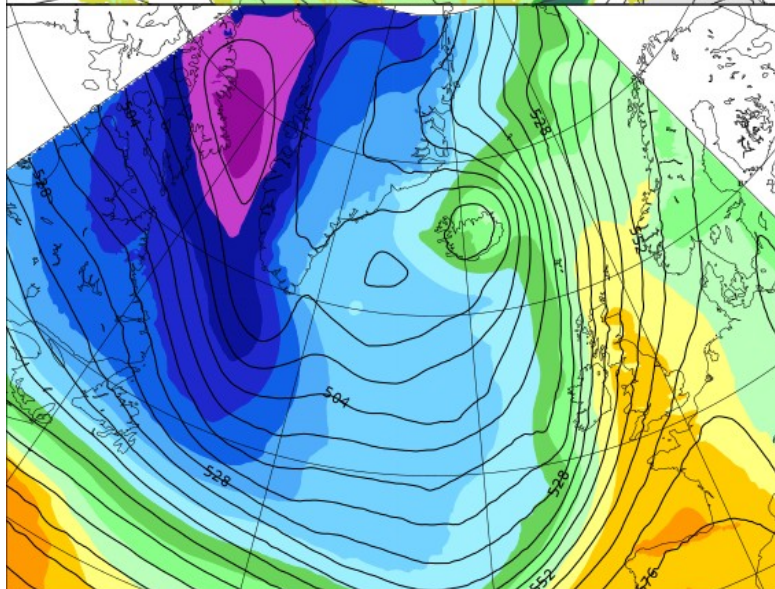
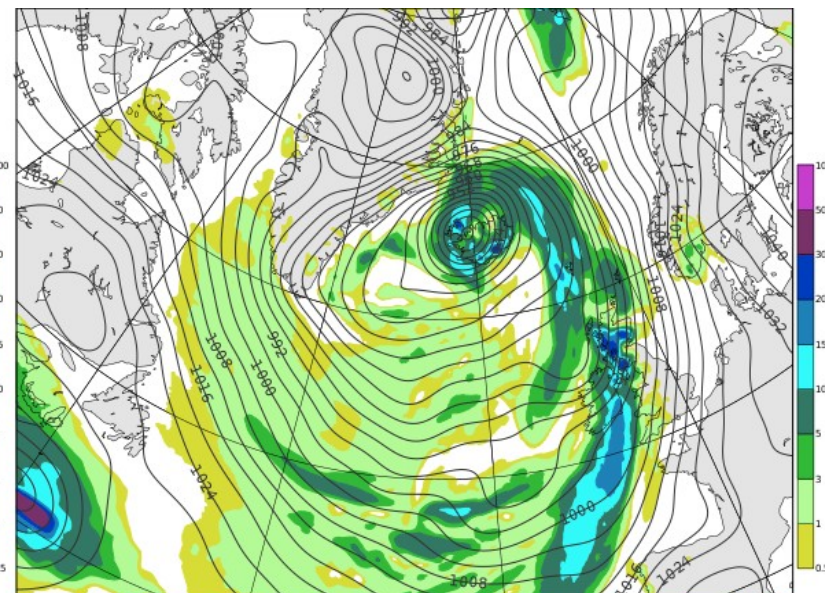
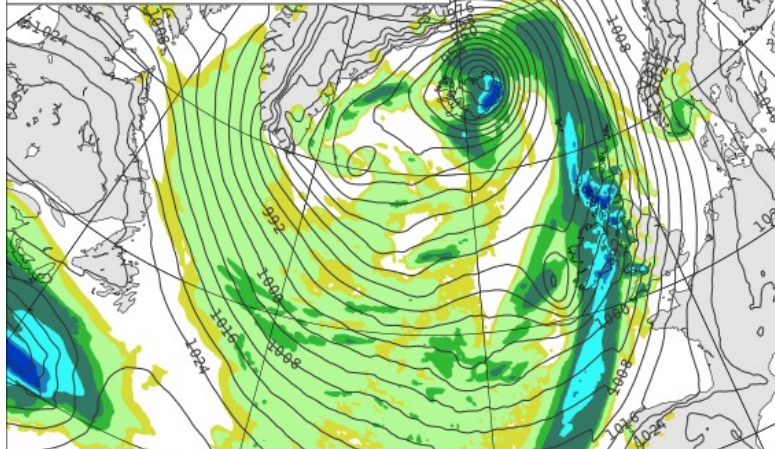
29 December 2015 21 UTC, +30h

ECM 0.125: Vinstra megin MSLP/TP GH/THK (500)

GSM 0.25: Hægra megin MSLP/TP GH/THK (500)

IT: þri 29.12.2015 00Z

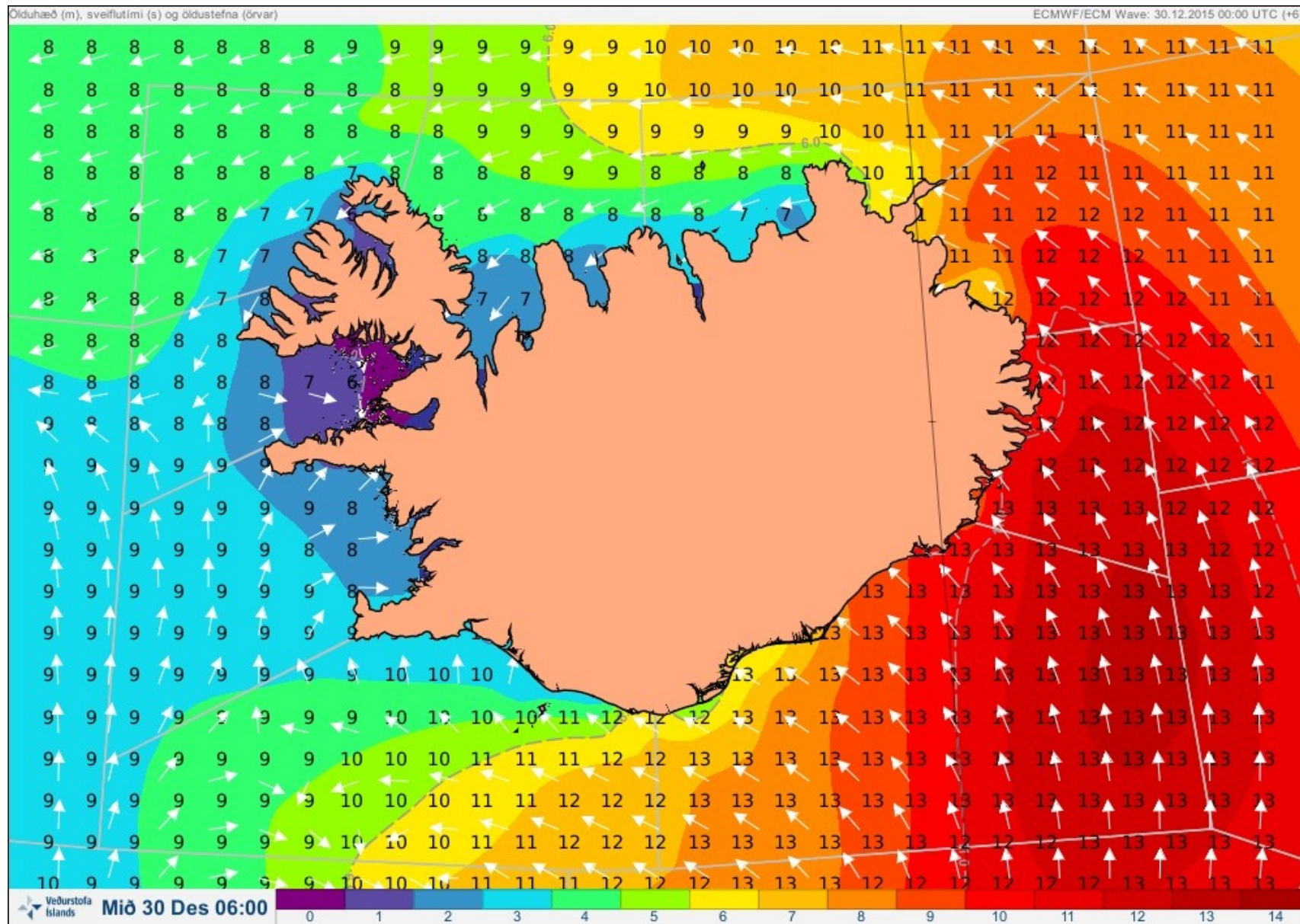
VT: mið 30.12.2015 06Z (+30 h)

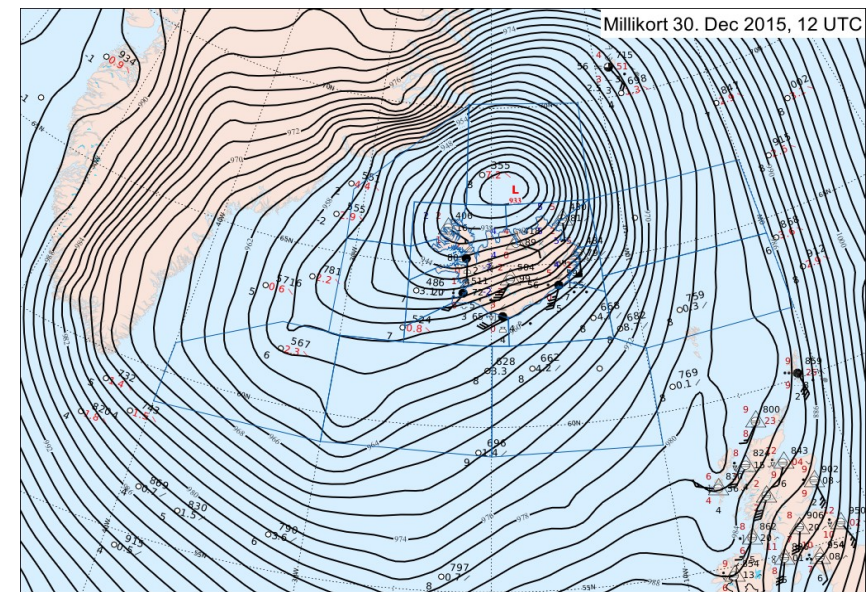
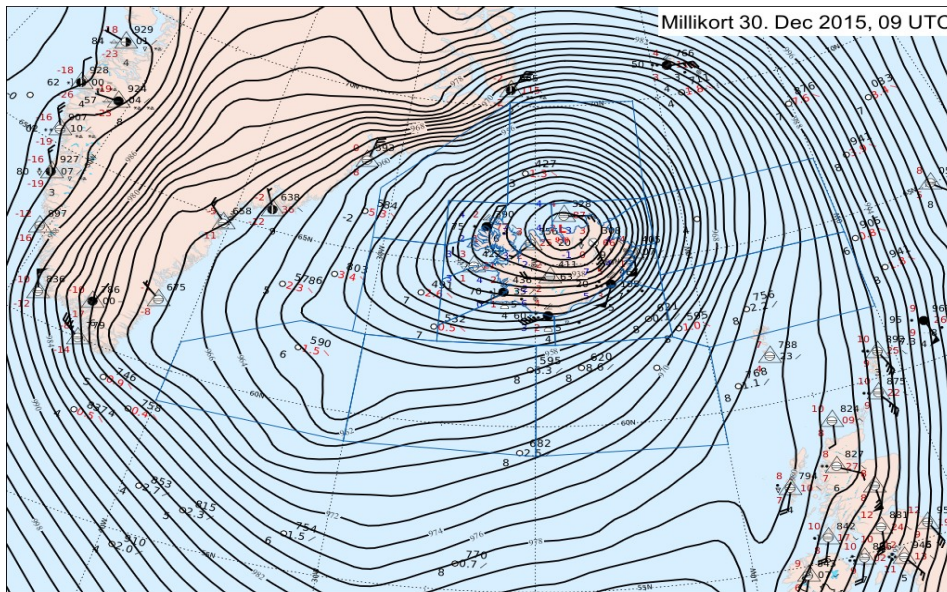
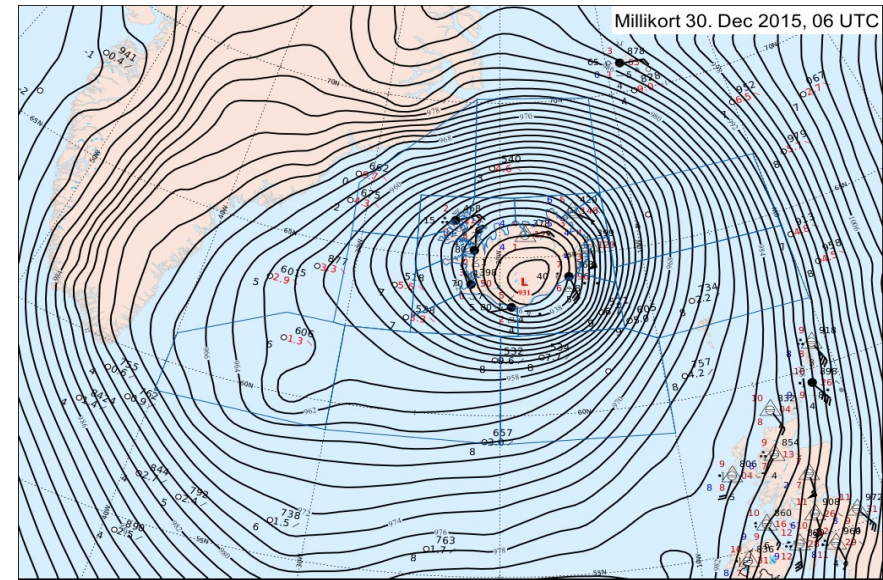
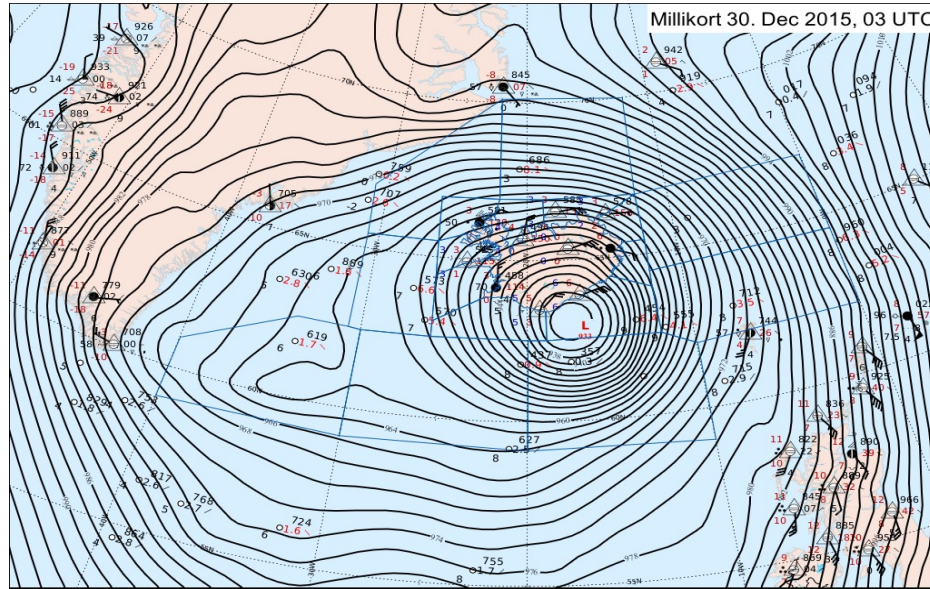


Additional problems:

- Torrential downpour in the east for the two previous days
- High tide
- High sea state with the very low air pressure
- Very bad wind direction for the East fjords

30 December 2015





30 December 2015

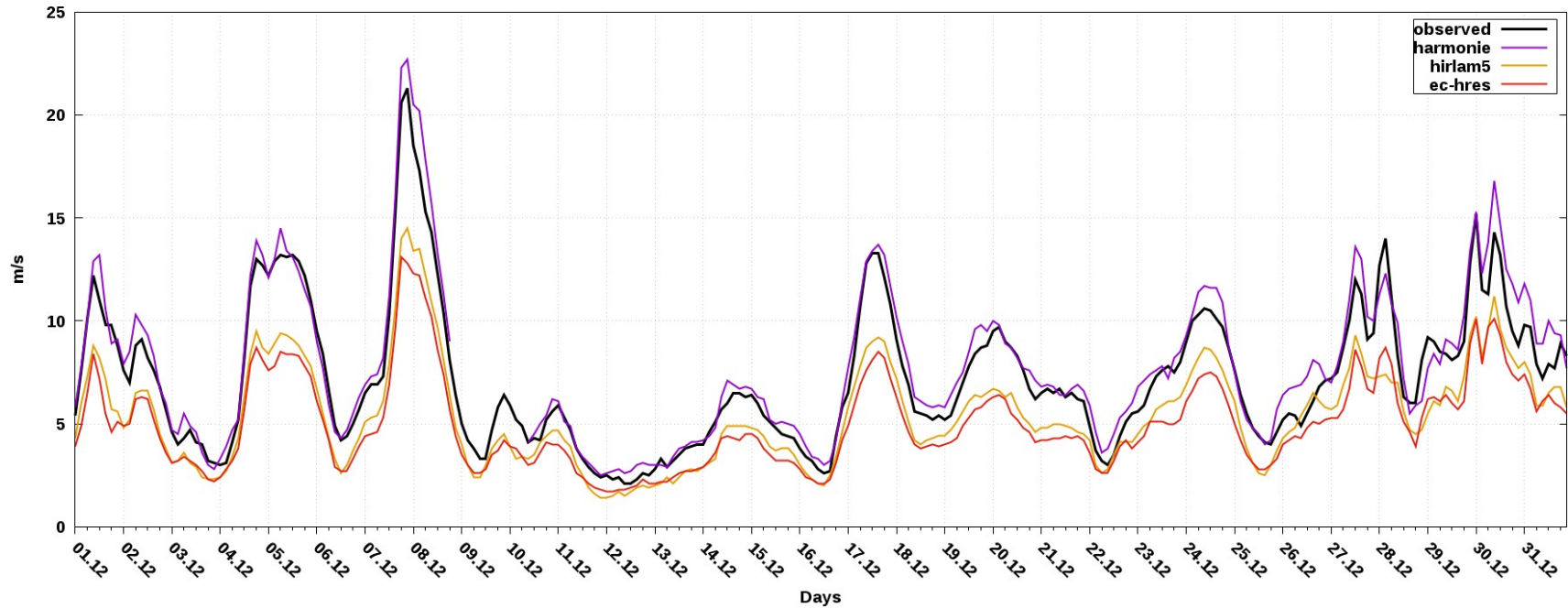


30 December 2015



Comparison of 10 m avg. wind velocity Dec.2015

Stations: 139 automatic IMO
Avg. windspeed at 10 m height
Models: harmonie,hirlam5,ec-hres it: 00,12 fc: 12,15,18,21
Period: 01.12.2015 - 31.12.2015



Thanks!

Questions?